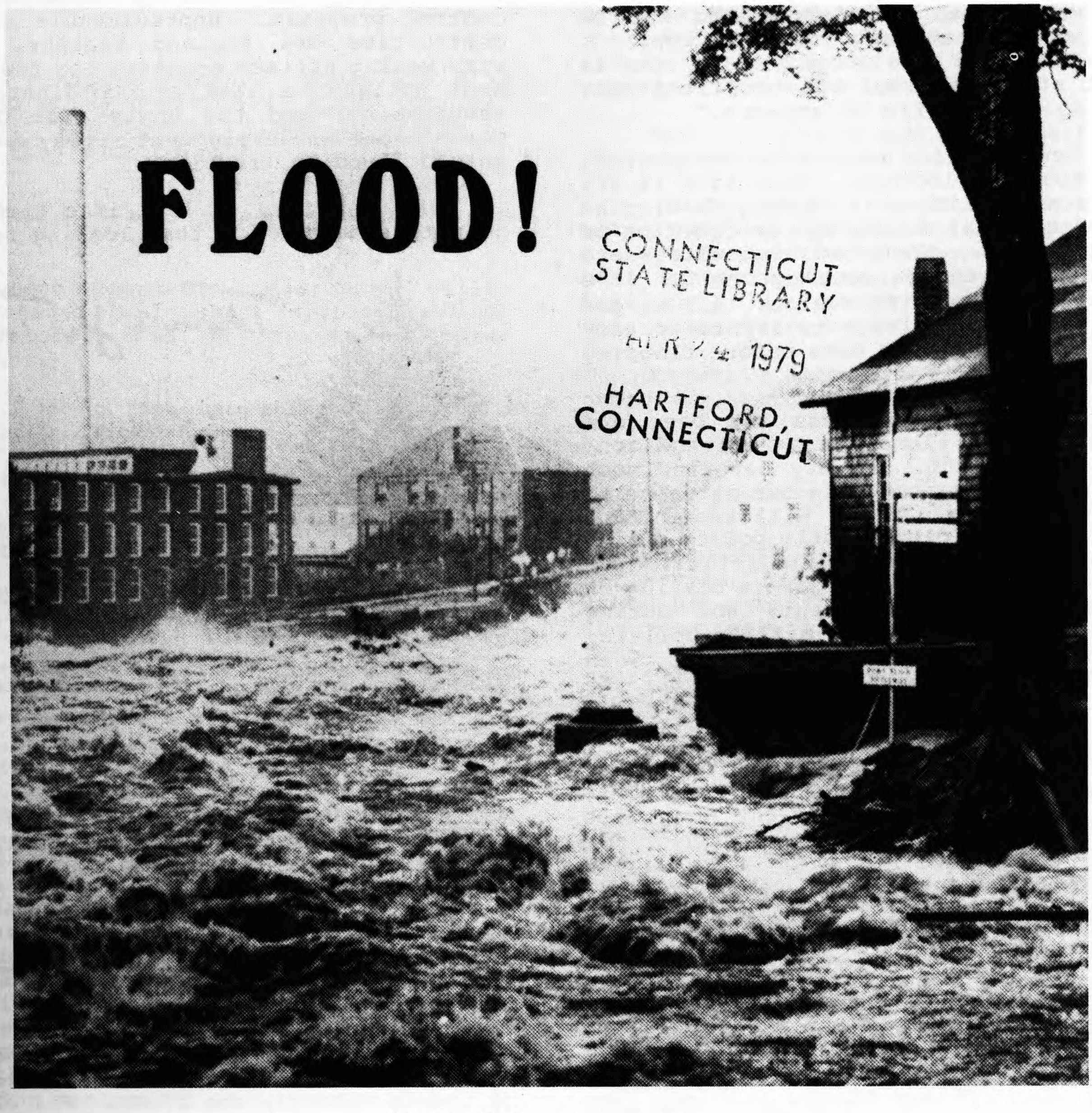
m90
b
4:6
.2

Connecticut Department of Environmental Protection

citizens' bulletin

Volume 4 Number 6 February 1977 $2/yr.



CONNECTICUT
STATE LIBRARY
APR 24 1979
HARTFORD,
CONNECTICUT

In this issue

From the Editor's Desk..............2
Flood Management: Part I...........3
Flood Management: Part II..........7
Trailside Botanizing................9
CAM News...........................10
Your February Environment..........11
New CEQ Director...................12
Institute of Water Resources.......13
DEP Permits Issued.................14
CBRU: Environmental Ed. Program...16

From the Editor's Desk

Society's response to the unending flooding dilemma is comparable to the apparent solution reached by the fellow with the leaky roof. When a friend asked why he didn't repair the roof, the man replied, "Because the only time I can fix the roof is after it stops raining, but once it stops, there's no need to fix it anymore."

We tend to think in similar terms about the question of flooding. When land is dry and the sun is shining it is easy to dismiss from mind the real danger and destruction of raging torrents. When the high waters are upon our towns and personal property, it's too late for preventive action. All we can do then is stoutly pledge to try to rectify the problem at a future date before flooding reoccurs.

Unquestionably progress has been and is being made in flood management and control in Connecticut. We are devoting much time, money, and manpower in our attempts to alleviate flooding. As Mr. Williams in Part 1 of our lead article so aptly points out no fewer than 25 agencies, 66 legislative authorities, and 76 programs have a bearing on Connecticut flood management; and during the past two years over 2.3 million dollars, exclusive of municipal expenditures, and structural projects were spent to combat the flooding problem.

Rivers, such as the Connecticut River which wreaked havoc on bordering communities in the 1936 storm, wrought much less damage on these same communities in 1955 due to dams, channelization, barriers, dikes, etc. constructed in the intervening years.

But the total flood program in this state can be largely characterized as one of reaction rather than initiative. A flood strikes, cripples, and afterwards spurs citizen and government attempts to prevent future flooding. Hartford, for example, after having been inundated in the hurricane of 1936, was all but ready for the 1955 storms and subsequently experienced negligible flooding. On the other hand the ill-prepared lower Naugatuck Valley learned a costly lesson in 1955.

In its aid to municipalities, DEP's program of flood management utilizes both structural and non-structural methods. Part II of our lead article outlines and evaluates DEP's attempts at meeting the flood problem to date; it is concluded that despite this Department's significant efforts many areas remain flood prone and others are jeopardized by incomplete flood control programs. Unpredictable and often destructive New England weather, coupled with waning citizen concern, too few government dollars, a lack of coordinated flood programming, and the unwise use of flood plain areas as development sites, adds up to untold flooding trouble.

Here at DEP, we feel it's time we all join together to fix that leaking roof.

Thomas J. Turick

Cover photo: Putnam, Connecticut celebrated its centennial in June, 1955. August 19, 1955, however, was a day never to be forgotten.

All other photographs in this issue from DEP files.

THE CITIZENS' BULLETIN IS SUPPORTED IN PART BY FUNDS PROVIDED BY THE U.S. DEPARTMENT OF THE INTERIOR, AS AUTHORIZED UNDER THE WATER RESOURCES RESEARCH ACT OF 1964, PL 88-379.

DEP Citizens' Bulletin

Published eleven times a year by the Department of Environmental Protection. Yearly subscription $2.00. 2nd class postage paid at Hartford, Connecticut. Please forward any address change immediately. Bulletin material may be reprinted without permission provided credit is given, unless otherwise noted. Address all communications to the Editor, DEP Citizens' Bulletin, Department of Environmental Protection, Room 112, State Office Building, Hartford, Connecticut 06115.

Flood Management in Connecticut

Part 1:
"Public Awareness & Government Dollars"

I'm taking a survey. Would you mind answering a few questions? Flood control, floodplain management, flood insurance -- what do they mean to you?

I'm sorry, I never give much thought to those things.

Flooded basements, disrupted utilities, damaged businesses, displacement of neighborhoods, loss of employment, human casualties.

Oh, I get it. Those are things which happen in Mississippi?....Florida?....er....ah....California?

Hmm. I was really thinking of Connecticut. If you will accept for the moment that there is a flood problem, to whom would you go to solve it?

Probably the Department of Environmental Protection, and the Army Corps of Engineers.

Not bad for a start. You would have to add the Department of Health, the Office of Civil Preparedness, the National Weather Service, the U.S. Department of Agriculture, Regional Planning Agencies, municipal offices, the U.S. Department of Housing and Urban Development, and the landowner(s) affected. In fact, there are over 25 agencies, 66 legislative authorities, and 76 programs which have a bearing on Connecticut Flood Management. At the same time, there is no single agency coordinating all these programs. In an effort to initiate coordinated planning a Department of Environmental Protection departmental task force on flood management was established in December 1976 by former Commissioner Joseph N. Gill. While the task force is not expected to change the management picture overnight, it nevertheless is a step in the right direction.

What are the chances of being flooded anyhow?

It depends on what you consider flooding. Is it anytime the basement is wet, or must there be sufficient water to canoe in the living room? Are we talking of seasonable flooding, annual flooding, or flooding of rare occurrences?

There must be someone who knows if my home is in danger?

Yes, but only if you live in selected locations in which substantial damage has historically occurred. To date, no single reference is available delineating flood-prone areas nor is there any universally accepted standard for protection. Fortunately, the National Flood Insurance Administration is in the process of mapping areas likely to be flooded by the largest storm expected in one hundred years.

What if I stay on high ground until conditions improve. Will I be safe?

Sorry. Major floods disrupt food and water supplies, police and fire protection. It may take months to recover. When Hurricane Agnes blew into Pennsylvania and New York in 1974, damage ran into billions. Some communities never recovered.

We haven't had a major flood disaster in twenty years, why be concerned?

Are you a taxpayer?

What's that got to do with it?

Suppose I said that about 100 million dollars has been spent or appropriated for flood management projects in Connecticut in the past several years alone? Suppose I noted that nationwide disaster assistance runs about 3 billion per year, mostly for flood disaster assistance?

I think I'm beginning to get the picture.

Building in the flood plain yields disastrous results. This is the North Branch of the Park River, Hartford County, 1955.

Our flood problems in Connecticut have evolved for a variety of reasons. The most significant losses have resulted from unusual and unpredictable events; the storms (usually hurricanes) of 1936, 1938, and the two of 1955. Widespread human suffering and extreme financial losses occurred. Other flood related damages, however, occur in selected watersheds, caused by local conditions. Recent flooding of Steel Brook in Watertown is an example of the isolated flood, not related to main stem backwatering (the backup of local tributaries due to high water in major watercourses).

More often than not, local flooding hazards have been aggravated by human activities. Filling in of wetlands, floodplains, and other natural storage sites reduces floodway capacities. Often, areas which have flooded annually without encroaching on human activity are considered as flood prone when human activity encroaches on the storage or floodway areas. In many cases, though by no means all, the developer has provided for the safety of occupants when building in flood prone locations, but has not considered upstream or downstream ramifications of his work. Local and state regulatory agencies have found it difficult to deny those incremental flood potential increases, although in many cases the legislative authority is present to do so. When growth has been substantial, increased peak runoff from impervious surfaces adds to the problem. Each home or business constructed in a flood prone site may imperceptively increase flooding. The net result of cumulative impacts, however, may result in increased water surface elevation upstream or increased peak discharge downstream. Poorly planned or outgrown drainage facilities aggravate or cause shallow flooding of individual properties, roads, and public utilities. Eventually, the economic, social, and safety costs escalate until a crisis event occurs. Then flood management is pursued as a result of public demand.

" ..100 million dollars has been spent...for flood management projects in Connecticut in the past several years..."

Attempts to mitigate damage from major storms, however, dominate the time and finances of the flood management planner. Although infrequent in occurrence, the severity of loss necessitates a high degree of protection. For example, the U.S. Water Resources Council and the Department of Housing and Urban Development use the one hundred year storm (the flooding levels expected to be equalled or exceeded in one hundred years) for planning purposes. The state utilizes other formulas which are similar when developing stream encroachment lines. Municipalities, other state and federal agencies, however, sometimes limit their design frequencies to lesser protection often the 25-year or 50-year storm.

The Connecticut River put Hartford under water in 1936.

What Flood Protection Costs

Perhaps the most studied, planned, and partially protected watercourse is the Connecticut River. The severe storms of 1936, 1938, and 1955 prompted major planning and project implementation. Twenty-two flood control dams have been constructed, predominantly in Vermont, New Hampshire, and Massachusetts, at a cost of $330,000,000 since 1936. Despite those expenditures, a recurrence of the 1936 storm (the flood of record) would result in multimillion dollar damages to the basin.

That expenditure is for the Connecticut River Watershed only. What about the state's other river basins? The Army Corps of Engineers has completed 18 special flood control works, costing $84,441,000; plus two hurricane flood protection projects worth $11,682,000. The spending isn't over yet. Two other projects have been proposed and are soon to be implemented: The $13,000,000 hurricane barrier for New London and the $75,000,000 Park River Local Protection project in Hartford. Within the past two years, the state alone has authorized, allocated, or spent $2,000,000 for projects and $110,000 for studies; the state, federal, and Watertown governments allocated $500,000 for emergency repairs to Steel Brook; the Soil Conservation Service spent $500,000 for a small watershed project, and several other projects are about to be funded in the multi-million dollar category. The preparation and losses from Hurricane Belle this fall cost $11,000,000 (not all of which was flood related). The above are special project costs. What about year to year?

Estimated Expenditures-Past Two Years

1.	Flood Insurance claims and premiums	$800,000
2.	National Weather Service, River Forecast Center, staff and associated expenses at $50,000/yr.	100,000
3.	Operation and maintenance of Corps of Engineers structures	information requested but not received
4.	Corps staffing	
5.	Soil Conservation Service staffing at $600,000/yr.	1,200,000
6.	Thames River Valley Flood Control Commission tax reimbursements to Massachusetts	44,000
7.	Connecticut River Valley Flood Control Commission tax reimbursements to Mass., New Hampshire and Vermont	62,000
8.	Connecticut DEP staffing-flood related at $80,000/yr. (salaries only)	160,000
9.	Operation and maintenance of Connecticut owned structures at $5,000/yr.	30,000
	TOTAL	$2,396,000

The above text and table is exclusive of most municipal expenditures which, under the present system, are not coordinated or reported to a central state program.

The $80,000 per year for state staffing is composed of the full or part-time services of a watershed technician, responsible for major flood control projects; a supervisor of dams, responsible for dam licensing and safety; a stream encroachment engineer who also doubles as the state coordinator for the National Flood Insurance Program; a recently hired flood hazard planner, responsible for developing coordinated state policies; several secretaries; the engineer for the Wetlands program; and other engineering services as needed.

Despite the enormous finances poured into structural projects, there has been a recent turn of events which may require massive expenditures for non-structural solutions. This is especially true for the Connecticut River watershed where seven dams to be constructed in New Hampshire and Vermont have been disallowed by those upstream states. It will, therefore, be necessary for Connecticut to employ a multi-faceted management program, including acquisition, relocation, floodproofing, improved flood warning, regulation of floodplain uses, and selected limited structural projects.

"...flood management is pursued as a result of public demand..."

The River's Reach, a major planning effort to delineate a flood damage reduction plan for the Connecticut River, has recently been approved by the four basin states. Our acceptance of the document commits the state to provide a coordinated, comprehensive flood management strategy. A major stumbling block may be the costs involved. Generally speaking, the federal government has not funded non-structural flood control solutions. However, the basin states are now requesting that $250,000,000 allocated for the seven upstream dams should be available for non-structural approaches, including land acquisition and land use planning efforts by both municipal and state agencies.

In an effort to curb escalating costs for new flood control structures, for protection of existing structures, and for federal disaster assistance, the National Flood Insurance Administration has promulgated regulations requiring purchase of insurance in all flood hazard areas and simultaneously mandating municipal and state management programs to discourage floodplain development and eliminate floodway development. Recent recodification of flood insurance regulations will have an impact on individuals far greater than any program to date. Non-compliance by municipalities may result in program suspension,

Aftermath of 1955 flood -- downtown Stafford, Connecticut begins to dig out.

placing a ban on any floodplain development financial assistance, and equally significant, possibly preventing the municipality from receiving disaster assistance. The other face of the insurance program is the opportunity for those already in flood hazard areas to purchase subsidized insurance. Non-purchase of this insurance may prevent homeowners from receiving disaster assistance and may prevent rebuilding in the same area. Unfortunately, through the failure of the state, municipal, and federal agencies involved, flood insurance is not being purchased by those already in flood hazard areas.

"... lack of coordinated state planning and implementation reflects, to some degree, the indifference of the public..."

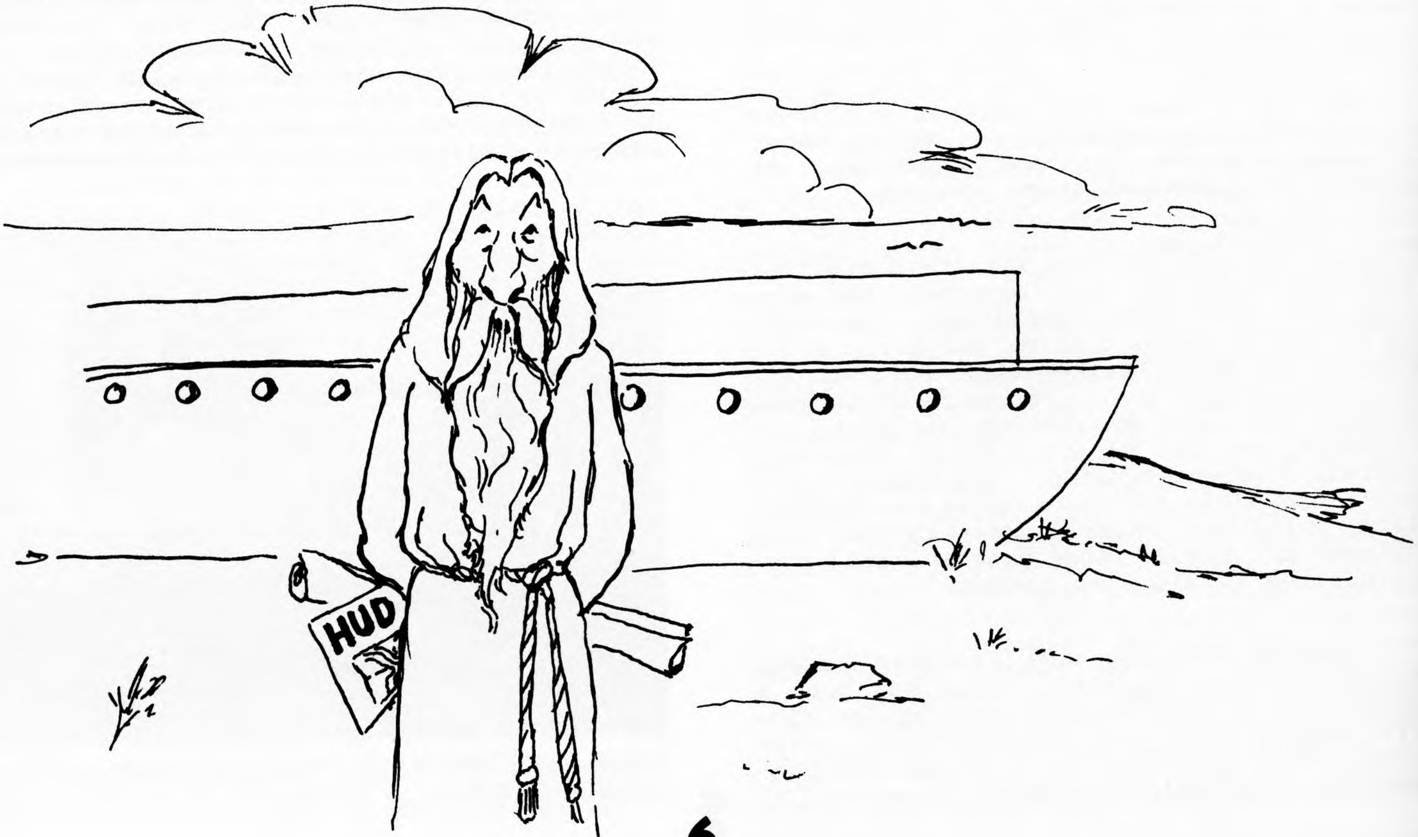
But that's government. What about you? Why is the individual apathetic toward flood control? The fact that there is a lack of coordinated state planning and implementation reflects, to some degree, the indifference of the public. If we accept the assumption that flood hazards exist, then we must assume that it is individual perceptions of the hazard that is in error. Ian Burton and Robert Kates, pioneers in perceptions of natural hazard research, conducted a study in 1964; the results still hold true. They state, "To many flood plain users, floods are preventable, i.e., flood control can completely eliminate the hazard. Yet, the technical expert knows that except for very small drainage areas no flood control works can effectively prevent the flood-inducing concentration of precipitation, nor can they effectively control extremely large floods of very rare occurrences." They continue, "Over the past several years we have interviewed or spoken with well over one hundred technical people concerned with floods, and we have never met one who discounted the possibility of a flood occurring again in a valley that had been previously flooded. By contrast, out of 216 floodplain dwellers interviewed in a variety of small urban places between 1960 and 1962, all of whom had a measurable flood hazard, some 84 categorically did not expect to be flooded in the future."

Often those who do admit there is a hazard, believe that someone must be taking care of it. If the individual knows of a flood hazard, certainly the government must know, and if they know, they must intend to do something about it. That attitude and a life jacket might keep your head above water.

A series of worksheets are available delineating programs, agencies, legislative authorities, reference material, and agency locations. For a copy of the worksheets, write to the Natural Resources Center, Department of Environmental Protection, Room 553, State Office Building, Hartford, Connecticut 06115.

* * *

This article was prepared by Allan N. Williams. Mr. Williams is an environmental analyst and flood management planner with DEP's Natural Resource Center.



Part 2:

"Meeting the Flood Challenge"

"The flooding issue is a very serious and very complex one. Progress in flood management can only occur through the combined efforts of an aware citizenry and a responsive government. To combat flooding DEP is committed to those measures which insure the wise use of the water resources of this state. We have accomplished much...we have much more to do."

DEP Commissioner Stanley J. Pac

The Problem

Water in flood stage will follow customary patterns which can be anticipated and avoided, if man is intelligent enough and foresighted enough to do so. In the upland area of deposition, the narrow valleys and steep stream channel gradient will cause vicious flash floods, the high velocity which will destroy many obstacles in its path.

Higher coastal areas on the other hand are relatively safe, with flood threat consisting of wave erosion along the land-water interface. Lowlands obviously are far more subject to flood damage. Along the major stream, a big flood will place the entire flood plain under water, although it is more of a ponding effect than a scouring effect. Lowland coastal areas have the misfortune to experience both effects.

Connecticut's recent history has recorded man's occasional lack of wisdom in adjusting to the landbase and to the hydrologic characteristics of the state's waterways. For example, upland areas are replete with examples of flash flooding which has caused great hardship and disaster to valley communities unwisely located along the banks of local streams. Memory naturally strays to the unforgetable floods of 1955, which washed one side of Winsted's Main Street down the aptly-named Mad River. On a larger scale, the entire Naugatuck Valley with its explosive combination of a constricted flood channel and large-scale valley bottom development suffered severe damage.

In the lowlands, man's experience also has been painful at times, often with the spring freshet but more particularly with floods associated with severe tropical storms or hurricanes. Despite the fact that oldtimers in valley towns keep an eye on the nearby river, man too frequently has refused to follow the advice of experience. Thus floodwaters periodically have taken a toll, a phenomenon starkly depicted in the famous photograph of rowboats floating through the lobby of Hartford's Bond Hotel during the 1936 flood.

Coastal lowlands, too, have had their confrontations with an angry Mother Nature. Being sandy, such areas are attractive sites for summer cottages and generally became densely developed. And then the inevitable hurricane came and reclaimed the beach as seen at Bluff Point in Groton. Although in several cases man was wise enough to convert such damaged areas into parks and thereby prevent a likely future recurrence of this flooding, in too many cases the landowners eagerly returned to their lot and rebuilt in the same exposed location. Although Storm Belle in 1976 fortunately did not deliver its expected punch, these coastal landowners still have the proverbial Sword of Damocles hanging over them.

The Program

The Connecticut Department of Environmental Protection through its Water Resources Unit regulates the use of the water resources of the state as they relate to the problem of flooding through the following functions: (1) land use regulation of tidal and inland wetlands; (2) a flood damage reduction program which includes flood control project, planning, design and construction; (3) land use regulation of river flood channels; (4) regulation of the use of submerged lands beneath tidal, coastal and navigable waters; (5) restora-

The Naugatuck River peacefully flows through Ansonia, lower Naugatuck Valley today. Note concrete retaining wall built in 1960's to protect town's business district.

tion programs; (6) regulation of construction and maintenance of dams; and (7) regulation of low flows in certain streams.

In response to flooding disasters and future threats, DEP has undertaken over the past years a number of measures, some of which were developed jointly with other state and federal agencies. The measures include:

1) Construction of large flood control dams cooperatively by the State and the U.S. Army Corps of Engineers. Most of these were built to protect the valuable Naugatuck Valley, although others were built to safeguard Winsted, Willimantic, and the Quinebaug Valley.

2) Construction of so-called Small Watershed Flood Control Projects cooperatively by the State and the U.S. Soil Conservation Corps. Completed examples are seen in Stafford, Norwich, Hamden, the Park River in Greater Hartford, and along the Blackberry River in northwestern Connecticut.

Ellis Dam -- A Furnace Brook - Middle River Flood Control Project in Stafford, Connecticut.

3) Construction of flood control dikes as seen particularly in Hartford and East Hartford. Also, a number of stream channelization works have been carried out, often in conjunction with construction of upstream dams. Key examples can be seen along the Naugatuck River in several communities, the Still River in Danbury, the Norwalk River in Norwalk, and the Mad River in Winsted.

4) Construction of hurricane barriers to protect highly-developed harbor areas as seen in Stamford and as proposed for the Shaw's Cove area of New London.

5) Establishment of State Channel Encroachment lines to control future flood plain development and to complement structural works as dams and channelization along a given stream. Presently 320 miles of these encroachment lines have been established, primarily along the Connecticut, Naugatuck, Hockanum, and certain other rivers as part of a comprehensive flood control management program.

6) Establishment by some municipalities of flood plain zoning, a key measure in those towns where channel lines have not yet been established.

7) Regulation of tidal and inland wetland and streamcourse areas which by statutory definition includes all flood plain soils as classified by geological origin.

The Future

Despite this massive reaction by the DEP a great deal remains to be done. Many areas remain flood-prone and others are jeopardized by incomplete flood control programs. And man still persists in eyeing flat flood plain areas as ideal development sites! Although the preferable answer is to opt for non-structural or regulatory methods to prevent the need for expensive future structural works to literally bail people out of the problems caused by the lack of foresight, the inherent problems of flooding demand that some emphasis also be given to structural means where they are absolutely necessary. To insure the wisest future use of Connecticut's natural resources, Commissioner Stanley J. Pac has directed that the DEP establish strong policy in the following structural and nonstructural areas:

1) Strict enforcement of channel encroachment line and inland wetland regularities by the State and/or towns to insure that no substantial future development is allowed in flood-prone areas.

2) Prohibition of State investment in development occurring within established channel encroachment lines and/or areas defined as tidal and inland wetlands and streamcourses.

3) Expansion of channel encroachment line coverage to include all key flood-prone areas, especially in urbanized locales.

4) Encouragement by the State of flood plain zoning by municipalities to lend further support to existing regulation of flood-prone areas.

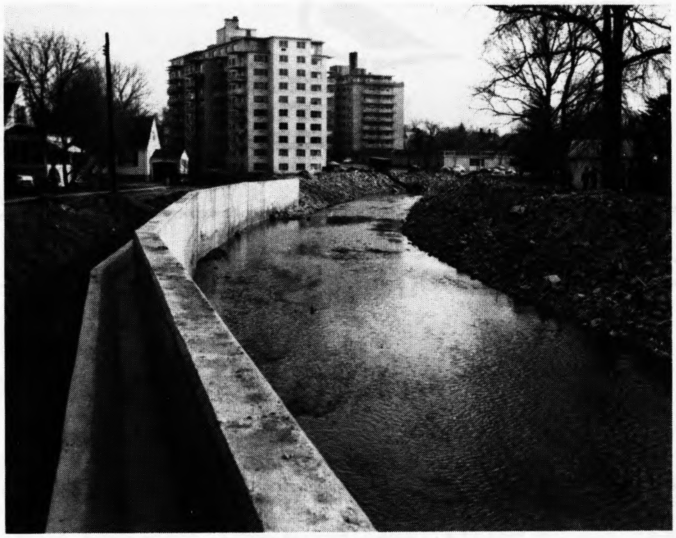
5) Construction of dikes and channelizing projects and hurricane barriers where such work offer the only possibility for correcting an existing problem.

6) Completion of small watershed projects underway or authorized which are required to protect public health and safety.

7) Renewal of storm-damaged coastal areas as public beaches to prevent future hazards to public health and safety and to increase the opportunity for public access to the Sound.

8) Regulation of construction and maintenance of dams to insure the safety of life and property downstream of the impoundment structure through a permit and regulatory process.

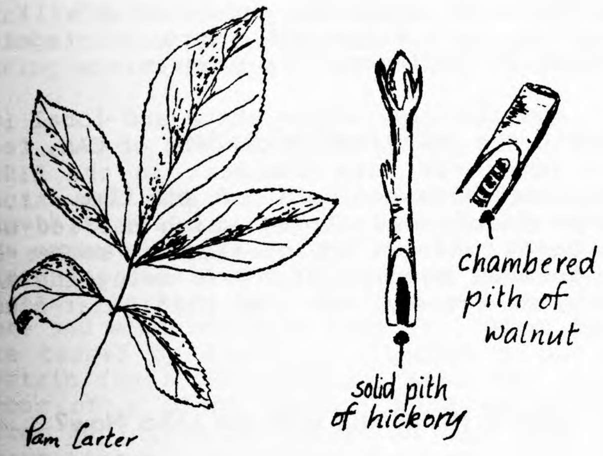
The attainment of these goals will be a significant step toward relegating the 1955 disaster to the status of Connecticut's "last major flood in this century."



Rooster River flood retention project in Bridgeport. Protected embankment is seen on both sides of river.

Trailside Botanizing

by G. Winston Carter



SHAGBARK HICKORY
(Carya ovata)

A winter walk in the woods can be a delightful experience if we make full use of our senses. The Shagbark Hickory is one of the more obvious and unusual discoveries one can make. Its bark consists of many long, loose strips of various sizes, sometimes measuring up to four feet in length. This shagginess does not appear in young trees, which have smooth gray bark. It takes on this appearance after it bears nuts, which happens when it is about 40 years old. Young trees can be identified by observing the winter buds which are buff in color with overlapping pointed scales.

Shagbark is not a tree of the city because it cannot tolerate impure air. It can grow in a variety of sites (usually only a few per acre) but prefers oak openings on well drained hillsides. It usually grows as a sapling in the shade of oaks and when an oak dies it quickly moves in to develop a canopy of its own.

People sometimes confuse hickories with walnuts, but this problem can be easily solved if the pitch and nuts are observed in these two groups. Hickories have a solid pith while walnuts have a chambered pith. If a ripe hickory nut is observed, the husk of the nut will be open in order to release the nut. Walnuts, on the other hand, usually remain tightly closed even if they have dried out.

Because its wood is tough and elastic, hickory is used for making tool handles, baseball bats and furniture. The twigs of the shagbark are eaten by deer and rabbits, while the nuts were eaten by the Indians and "nut cracks" were popular events of our early pioneer boys and girls.

Solar Energy Meeting

The next meeting of the Connecticut Solar Energy Association is scheduled for Sunday, March 6, 1977 at 3:00 p.m. in the auditorium of the College of Agriculture, University of Connecticut, Storrs. The meeting will feature a lecture by Joseph A. Belanger, Director of Research and Policy Development, Connecticut Department of Planning and Energy Policy. His subject will be "Solar Energy Legislation." For further information contact Dr. K. Raman (203) 649-9122 or John Ochwat (203) 264-0848.

coastal
area
management
71 capitol avenue hartford, conn. 06115

CAM NEWS

CAM & the Long Island Sound Study

A Study of a Study?!?

"But we just finished the Long Island Sound Study - why are we going through all this again?" This question, repeatedly raised most recently at meetings on coastal area management sponsored by the League of Women Voters, recurs again and again when people first learn about the Coastal Area Management Program. Although the Long Island Sound Study and CAM are quite distinct in nature and purpose, confusion between the two projects is understandable. We hope this article will help clarify the differences between them.

What was the Long Island Sound Study?

The Long Island Sound Study (LISS) analyzed the problems and needs of Long Island Sound and its related shorelands. Its goal was to produce a plan which would "balance the needs to protect, conserve and develop" that area. Federal, state and regional officials, under the overall coordination of the federally funded New England River Basins Commission, conducted the LISS between 1971 and 1975.

Ten major subject areas were addressed, each by a separate study group. The ten subjects were: land use, water management, shoreline appearance and design, erosion and sedimentation, flood damage reduction, recreation, fish and wildlife, transportation, minerals and mining, and electric power generation.

The final reports contained eighty-six recommendations for solutions to problems in the Sound area. In order to convey an idea of the nature of the recommendations, here are a few of those which were considered high priority: completing a secondary sewage treatment program, a State policy declaration to improve access to the Sound, requiring an energy conservation program, and adopting flood plain management regulations. A major recommendation of special significance is that "each state should establish a coastal zone management entity or group to guide the development of a management program and assure its implementation."

How do the LISS and CAM Differ?

Although the LISS and CAM both serve the same ultimate goal of wise and balanced use of our coastal resources, their immediate purposes differ.

Firstly, whereas the LISS was designed to investigate problems in the Sound region and recommend specific actions for solving them, CAM is developing a long-term management program; a decision-making system to identify problems and implement solutions.

Secondly, the LISS was exactly what its name implies: a study. Its final result was a set of recommendations; it had no power to ensure that those recommendations would ever be carried out. In contrast, CAM's objective is actual implementation of a coastal management program. The program will be taken to the General Assembly for statutory authority in the 1978 session. If it is passed and then approved by the U.S. Secretary of Commerce, Connecticut will be eligible for unlimited years of federal funding to implement the program.

And thirdly, while state and local interests are the primary concern of CAM, federal interests were dominant in the LISS. This was because each of the ten study groups (mentioned above) which carried out the Study had as its chairman a member of the federal agency which was doing the majority of the work for that particular study area.

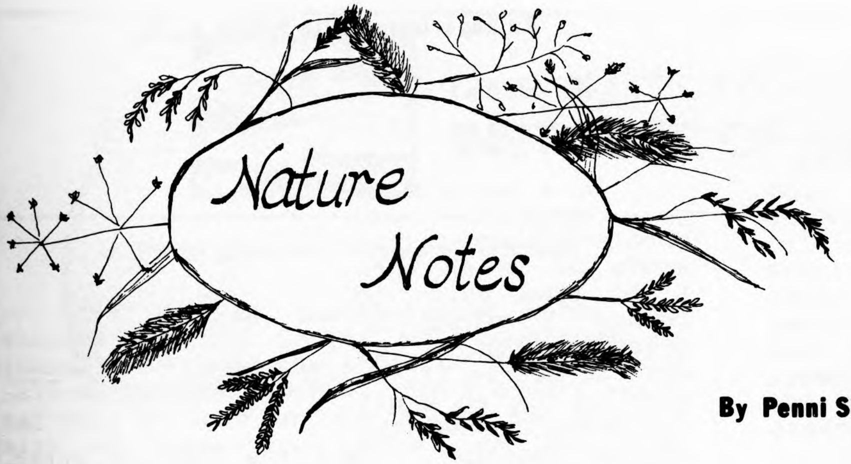
What's Happening with the LISS Now?

Much of the information collected and the data sources identified during the LISS has been useful to CAM.

Also, in December the CAM Advisory Board voted its support of six of the thirty-four LISS recommendations designated for state action. It is not CAM's role to implement these recommendations, but the Board's endorsement stresses the importance of their implementation by the State. The six recommendations concerned:

1. the State's role in decreasing water pollution

Cont. on Page 12.



By Penni Sharp

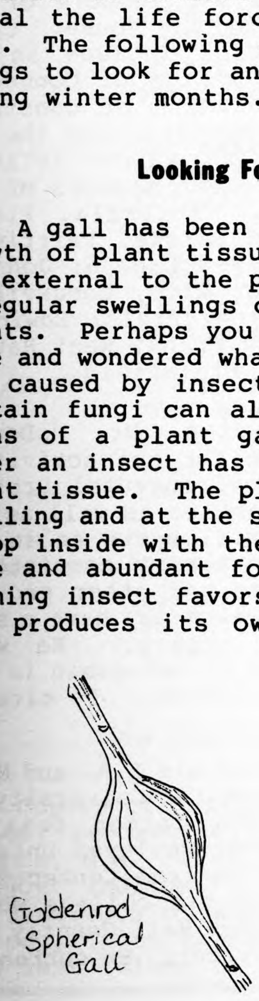
Your February Environment

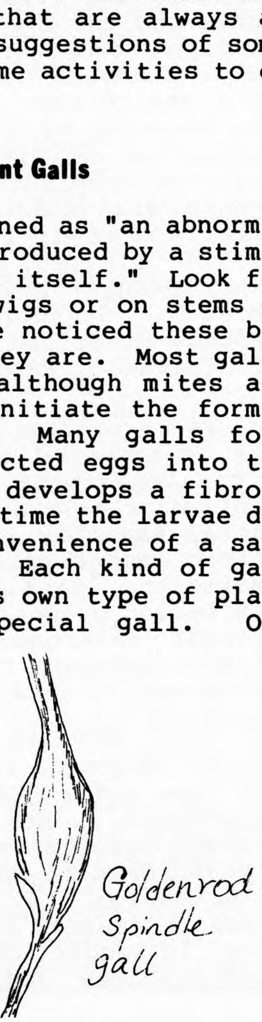
February is: Lengthening days...icicles...cormorants at the mouths of rivers...Groundhog Day...a snow moon...great horned owls on the nest...flocks of goldfinch feeding on thistle seeds...the shortest month...thaw...deer searching for browse.

The month of February can be a good time to explore many aspects of the natural world. At a time when much of life is dormant, you may be surprised at the signs of activity that you will discover. Close observation of dormant plants and animals may reveal the life forces that are always at work. The following are suggestions of some things to look for and some activities to do during winter months.

Looking For Plant Galls

A gall has been defined as "an abnormal growth of plant tissues produced by a stimulus external to the plant itself." Look for irregular swellings on twigs or on stems of plants. Perhaps you have noticed these before and wondered what they are. Most galls are caused by insects, although mites and certain fungi can also initiate the formations of a plant gall. Many galls form after an insect has injected eggs into the plant tissue. The plant develops a fibrous swelling and at the same time the larvae develop inside with the convenience of a safe home and abundant food. Each kind of gall forming insect favors its own type of plant and produces its own special gall. Oak trees are preferred by many gall producing insects. Goldenrod galls are commonly found in areas where these plants grow.


Goldenrod Spherical Gall


Goldenrod Spindle gall

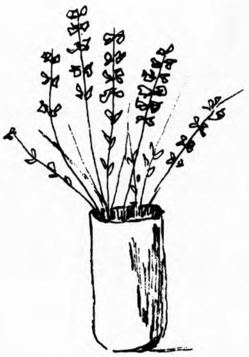
Galls occur in many forms, and are fascinating. The life cycles of the gall insects are varied also, some being relatively simple others extremely complex. If you are succesful in your search for galls, collect one or two (never more than you need, please!) and bring it in to examine. Using a pen knife, carefully cut it down the middle. If you have collected a goldenrod gall, you will find inside a plump white grub, the larva of a fly (trypetidae). While still a larva, it must cut an exit out of the gall. Its mouth at this stage is adapted for chewing, but, following its metamorphosis, the adult fly is unable to chew, and would be imprisoned within the gall if not for the work of the grub.

If you wish to learn more about the fascinating world of plant galls, or would like to identify what you collect, I recommend the book - Galls & Gall Insects by R.E. Hutchins.

Preserve A Snowflake

While it is snowing, go outside and catch snowflakes on a piece of black construction paper. While still outside carefully spray the snowflakes with a clear acrylic spray. (This is available in art supply stores and some hardware stores.) You now should have some snowflakes that you will be able to bring indoors and examine with a hand lens or a microscope. Snowflakes always appear as six-sided crystals. No two are exactly alike. Sometimes they appear flat and at other times have long needles. Since individual snowflakes often clump together, the ones you have preserved may actually be groups of snowflakes. Can you see a six-sided pattern in any of the?

Forcing Shrubs



Now is a good time to try forcing different plants into bloom. Forsythia can be cut and placed in water. In a few weeks you should have a vase of yellow flowers to brighten the day. You might try some other twigs and watch the development from bud to leaf or bud to flower. Spice bush, alders and birches are some others to try.

Use clippers and make a clean cut. Crush the end of the cut twigs as this will allow for more absorption of water.

An Experiment With Frozen Earth

On a sunny day, go outdoors and choose a place in the woods or in an open field from which to remove a piece of frozen earth. It will be better if you plan to dig on a day following a thaw (for obvious reasons). Take the lump of earth and seal it tightly in a jar. (An extra large mayonnaise jar serves well.) Place the jar on or near a windowsill and watch. You will be surprised at what comes to life.

(CAM Cont.)

2. expanding "208" area-wide wastewater planning activities
3. developing inland parks to relieve recreational pressure on coastal areas
4. encouraging towns to adopt zoning that would restrict the use of waterfront property to water-oriented activities
5. acceptance of the tidal zone as a critical resource by all State departments and agencies
6. nomination by the Department of Planning and Energy Policy of coastal "special opportunity areas" in revising the Plan of Conservation and Development.

Cross Country Skiing Footnote

Last month in our article "Cross-Country Skiing in Connecticut" we neglected to mention a valuable resource available to the cross-country skier. The Ski Touring Council, Troy, Vermont 05868 is a nonprofit, all volunteer membership committee founded in 1962 for the sole purpose of re-introducing the then-forgotten sport. Among its various activities it gives free counsel to colleges, schools, clubs, business enterprises -- any group or person interested in starting a ski touring program.

In order to further promote the sport, assist the experienced tourer and help the beginning skier, the Council publishes two excellent annual publications: the 130 page Ski Touring Guide ($3.00) and the Schedule ($2.75). These two publications contain a wealth of information for the ski touring enthusiast.

For further information on the activities of the Council or on its publications, contact Rudi Mattesich, President, Ski Touring Council, Troy, Vermont 05868.

CEQ Appoints New Director

The Connecticut Council on Environmental Quality (CEQ), announced on January 14 the appointment of Dr. Edward I. McDowell, Jr. as Executive Director of the Council.

The Council on Environmental Quality was established by the General Assembly in 1971. Its members are appointed by the Governor, the President Pro Tempore of the Senate and the Speaker of the House. CEQ's principal responsibilities include an annual evaluation of the status of Connecticut's environment, assessment of construction activity by State agencies and the investigation of citizen complaints relating to the environment. Present members of the Council are Domenic J. Forcella, Plainville, Chairman; Philip Barske, Fairfield; Donal C. O'Brien, Jr., New Canaan; John E. Baker, Orange; Edward W. Rice, Uncasville; Thomas F. Sarubbi, Wethersfield; Edwin C. Fordham, Stratford; Rudy Frank, West Haven; and William C. Harding, Plainfield.

As Executive Director, Dr. McDowell will be expected to monitor the activities of the Department of Environmental Protection and other State agencies as well as the General Assembly. He will serve as an ex-officio member of a great many committees, commissions, task forces and other groups, considering proposals, which may have a significant environmental impact. He will further represent CEQ as an ombudsman in the investigation and resolution of citizen complaints.

Dr. McDowell received his B.A. and M.A. from Yale and a Ph.D. from the University of Connecticut. He is the former Dean of Freshmen and Admissions at Wesleyan University and Dean of Men at Central Connecticut State College. Prior to his college work, he was Headmaster of Hamden Hall Country Day School in Hamden, Connecticut. He currently makes his home in North Haven.

university of connecticut

INSTITUTE OF WATER RESOURCES

Institute Seminar Series Continues

The 1976-77 Institute of Water Resources Seminar Series will continue to focus in 1977 on the topic of RIVERS: WHO GETS WHAT, WHEN AND WHY. The February seminar will be held in Room 314 of the University of Connecticut School of Law, the Greater Hartford Campus, in West Hartford. The remaining seminars will be held in Room 200 in the Nathan L. Whetten Graduate Center on the University of Connecticut Storrs campus. All seminars will begin at 3:30 p.m. with refreshments served at 3:00 p.m. Parking facilities are available at both campuses; persons attending the Storrs seminars should plan to stop at the Traffic Information Booth for a parking permit.

2/16/77	Professor Clifford B. Davis University of Connecticut School of Law "The Legal and Institutional Aspects of Connecticut River Diversions"
3/16/77	Dr. Gene E. Likens Professor of Ecology Cornell University "Effects of Acid Precipitation on Aquatic Ecosystems"
4/20/77	Mr. R. Frank Gregg Chairman, New England River Basins Commission Boston, Massachusetts "The Framework for River Resources Management Policies, Institutions and Programs"

New Publication Available

Copies of Institute Report No. 26, entitled, Proceedings: Third Wetlands Conference, M.W. Lefor, W.C. Kennard and T.B. Helfgott (Editors), are now available from the Institute of Water Resources for $3.00 per copy (plus Connecticut sales tax). In this last volume of a three-part series on inland wetlands, eight papers which deal mainly with the functional aspects of wetlands and constitute the proceedings of the Institute's Third Wetlands Conference, held June 14, 1975 on the Storrs campus, are presented.

Designed to examine the more perplexing questions of and to provide basic information on inland wetlands, the conference addressed itself to the following topics: a discussion of inland wetlands definitions, incorporating the pertinent information from all three conferences; an examination of the system function of a wetland, with emphasis on the proper treatment of wetlands in community planning; manipulation of wetland ecosystems for societal purposes such as waste treatment; the unique characteristics of wetland metabolism and energy flow; freshwater wetlands and wildlife habitats; the management of wetland forests, specifically illustrating Connecticut's Red Maple swamps; the epidemiologic and public health aspects of wetlands; and, the interaction of man and wetlands from a sociological viewpoint. Various illustrations, reference items and lists of name equivalents and conference participants are included in this 142-page report.

Connecticut Water Resource Organization Directory Planned

As a service to Connecticut residents, businesses and governmental agencies, the Institute is now planning publication of a directory listing water resource related organizations and associated personnel in Connecticut and the services and types of information available from each. Due to the numerous requests for assistance received by the Institute Director and the limited staff and facilities at the Institute, the Institute is now unable to provide information easily or refer persons to the appropriate firms or agencies effectively.

The Institute plans to contact the many Connecticut organizations with which it has been involved on water resource matters. However, to compile a complete listing, the Institute would appreciate having interested water resource related consulting and engineering firms, laboratories, service agencies, University affiliated organizations, etc. provide us with a summary of their activities and available services. Please forward materials to: Institute of Water Resources, Box U-37, University of Connecticut, Storrs, Ct. 06268.

Permits Issued

Dec. - Jan., 1977

Air Compliance

December 1
Jackie Robinson School
Permits to operate four natural gas-fired boilers in New Haven

December 17
The Woodbury Supply Co.
Permit to operate an asphalt batching plant in Woodbury

December 23
Combustion Equipment Assoc., Inc.
WESCO Division
Permit to construct two storage silos for Eco-Fuel II in Waterbury

December 23
Jennison-Wright Corp.
Permit to construct an asphalt protective coating mixing tank in South Windsor

December 23
Philips Medical Systems, Inc.
Permit to construct a 250 H.P. boiler in Bridgeport

December 23
The General Electric Co.
Permit to construct a water-tube boiler in Plainville

December. 30
CTE Sylvania, Inc.
Permit to operate a Comptro Modified Combustion Unit in Watertown

December 30
Mirror Polishing & Plating, Inc.
Permit to construct a gas-fired air make up unit in Waterbury

January 1
Fournier Street Animal Shelter
Permit to operate a pathological incinerator in New Haven

January 1
Leasetex Systems, Inc.
Permit to modify an existing 300 H.P. boiler to fire #4 oil and waste oil in Branford

January 1
Combustion Engineering, Inc.
Permits to construct and operate a controlled mixing history furnace in Windsor

January 1
Ferro Corp., Composites Div.
Permits to operate a vinyl coating machine and a fume incinerator in Norwalk

January 1
Owens-Illinois, Inc.
Permit to operate three material storage silos in Milford

January 4
United Technologies Corp.
Pratt & Whitney Aircraft
Renewal of permits to operate sources of air pollution in East Hartford and Middletown

January 6
The Stanley Works, Hardware Div.
Permit to operate a modified lithographing line in New Britain

January 24
The Torrington Co.
Extension granted for permit to expand metal cleaning line

Water Compliance

October 18
Maurice's Country Meat Market
Permit to discharge 580 gallons per day of meat processing wash water in Canterbury

November 10
Dennis Davey
Permit to discharge 450 gallons per day treated domestic sewage in Tolland

November 15
Merit Metal Finishing Co.
Permit to discharge 36,000 gallons per day of pre-treated metal finishing wastewater to the sewer system of the City of Bridgeport

November 15
Sperry Rand Corp.
Remington Electric Shaver
Permit to discharge treated metal finishing wastewaters to Bridgeport Harbor

November 15
Woodridge Lake Sewer District
Permit to discharge treated municipal sewage to the groundwaters of the Bantam River watershed in Goshen

November 16
Automatic Plating Co.
Permit to discharge 288,000 gallons per day of pre-treated metal finishing waste water to the sewer system of the City of Bridgeport

December 10
Harry Sobeski
Permit to discharge 400 gallons per day milk parlor treated wastewater to Scantic River watershed in Somers

Permits Issued (cont.)

Water Compliance

December 20
The Hitchcock Chair Factory
Permit to discharge boiler blowdown wastes to the groundwaters of the Farmington River in Riverton

December 21
Nutmeg Beverage Co.
Permit to discharge 2,500 gallons per day of bottle washer pre-rinse and concentrate washout to the sewer system of the Town of Manchester

December 22
Uncas-on-Thames Hospital
Permit to discharge 75,000 gallons per day treated domestic sewage to the Thames River watershed in Norwich

Water Resources

December 9
Victor Lasnier
Permit for construction of an Industrial Park on property adjacent to the Bantam River in Litchfield

December 10
Town of Greenwich
Permit to dredge and maintain a basin in Greenwich Harbor

December 21
Sun Oil Co.
Permit to construct a gasoline outlet facility within an inland wetland in the City of New London

December 23
Spicers Noank Marina
Permit amended to include additional structures

December 27
Associated Dock Builders
Permit to construct and maintain a dock and float in the Connecticut River at Essex

December 27
Josephine Westerberg
Permit to maintain an existing filled area, a wood pier and a pile and timber pier in the Thames River at New London

December 27
Donald Sweet and Rudolph Santacroce, Jr.
Permit to place and maintain fill in the Thames River at Groton

December 27
John and Marjorie Schufer
Permit to maintain a pair of concrete stairs and an existing rock jetty at Old Saybrook

January 11
T. C. Johnson Yacht Sales
Permit to construct an addition to an existing dock and several other structures at Essex

January 11
DEP Fish and Water Life Unit
Permit to install and maintain a concrete plank ramp and timber bulkhead at the State boat launching facility on the Connecticut River at Old Saybrook

January 11
City of Stamford
Urban Renewal Commission
Permit to install and maintain a storm drain outfall to the East branch, Stamford Harbor at Stamford

January 11
Mystic Shipyard, Inc.
Permit to construct and maintain a stone dike and dredge two basins in the Mystic River at Groton

January 11
Richard L. Aiello
Permit to construct two houses on an inland wetland in Trumbull

January 11
Department of Transportation
Permit to construct a safety rest area within an inland wetland in the Town of Middletown

January 11
Department of Transportation
Permit to place a pipe in a culvert within an inland wetland in the Town of Pomfret

January 11
Department of Transportation
Permit to construct an acceleration lane onto Rt. 15 within an inland wetland in the Town of Berlin

January 18
Joseph Dinatale
Permit to construct a 117 lot subdivision within an inland wetland in the Town of Wallingford

January 21
National C.S.S., Inc.
Permit to perform grading and place a bituminous concrete parking area within stream encroachment lines for the Norwalk River at Norwalk

CBRU's Are Coming

A network of regional workshops will soon be underway to assist teachers in ordering special curriculum resource packages in environmental education. Under the sponsorship of the Department of Environmental Protection and the State Department of Education, the program will give 1,000 teachers the opportunity to receive an environmental education resource package specifically geared to their grade level and subject area.

The short workshops, scheduled for February and March, will introduce teachers to the Computer Based Resource Unit system (CBRU). At the workshop teachers will receive a resource manual to assist in the ordering of curriculum resource packages of their choice. From the resource manual, a teacher just selects an environmental unit of interest and then within that unit, specific objectives to be achieved. For example, a social studies teacher who wants to plan a unit on U.S. energy problems might select the unit "Energy-Society" and one of the many possible objectives, "To identify United States trends in energy consumption since 1860." A science teacher might select the unit "Primary Ecology" and several of the unit's objectives on the concepts of Adaption and Evolution. The units range in topic from pollution to environmental law. There are 10 units available at the elementary level, 14 at the Junior High School level, and 11 at the Senior High School level.

These objectives, along with a few other learning variables, such as reading level and interest areas of students are sent by the teacher to the CBRU program center. Within three or four weeks, each teacher attending the workshop will receive a curriculum package specifically tailored to their request. The package contains background information, activities, measuring devices and a comprehensive list of supplementary curricular materials.

One unique feature of the CBRU program is that two teachers selecting the same unit and objectives, but indicating different reading levels for their class, would receive different curriculum guides. Another feature is that the program serves the environmental educator's needs of all disciplines and grade levels. Teachers in all subjects and K-12 levels can utilize the program.

In the first year, there are sufficient funds to provide the program to a thousand teachers in the state. In order to provide for an equitable distribution among school districts, regions have been allotted a specific number of invitations to the workshops based on 1975 school enrollment figures.

Teacher awareness workshops will be conducted around the state to introduce the CBRU concept to teachers. The Environmental Education Center (EEC) at Area Cooperative Educational Services in New Haven is organizing the workshops and training workshop leaders. They have identified 30 sites around the state. Workshop leaders will include members of the EEC staff, the Connecticut Science Teachers Association, and other friends of environmental education.

Many organizations have cooperated in implementing this program. They include Connecticut Audubon Society, Project Oceanology, the Pomfret Student Environmental Center and the regional education centers (ACES, CREC, CES, NARES, LEARN, RESCUE).

Invitations are being sent to individual superintendents in every school district in the state. Contact your school's superintendent if you are interested in participating.

For further information on the workshops and CBRU contact Jane Hart, Environmental Education Center, 800 Dixwell Avenue, New Haven, Connecticut. Tel: (203) 562-9967.

DEP citizens' bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

Phone: 566-5524

Commissioner: Stanley J. Pac
Director, Info & Ed: Greg Sharp
Editor: Thomas J. Turick
Illustrator: Deborah Dumin
Layout: Rosemary Gutbrod
Typist: Linda Mrowka

SECOND CLASS POSTAGE PAID
AT HARTFORD, CONNECTICUT.